PREFACE

1. SAFETY PRECAUTIONS

Follow basic safety precautions before using electrical appliances.

1. **READ ALL INSTRUCTIONS.**
2. To protect against electrical shock, do not immerse cord, plug, or appliance in water or other liquid.
3. Do not touch hot surfaces. Always use oven mitts when handling the hot bread pan of bread.
4. Close supervision is necessary when the appliance is used by or near children.
5. Unplug the unit from the outlet when not in use and before cleaning. Allow the breadmaker to cool before attaching or removing parts.
6. Do not touch moving parts.
7. Do not operate the appliance with a damaged cord or plug or after the appliance malfunctions, or it has been dropped or damaged in any manner. Return the appliance to the nearest authorized service facility for examination, repair, or mechanical adjustment.
8. Attachments that are not recommended or sold by the appliance manufacturer should not be used.
9. Do not use outdoors.
10. Do not let the cord hang over the edge of the table or counter or touch hot surfaces.
11. Do not place on or near a gas or electric burner, or in a heated oven.
12. To disconnect, grip the plug and pull it out from the wall outlet. Never pull the cord.
13. Do not use the appliance for other than the intended use.
14. This product is intended for household use only.

2. SERVICING PRECAUTIONS

The following cautions should be observed when troubleshooting.

a) As the appliance is made to be serviced only by properly qualified service personnel, it cannot be repaired by the user.

b) Before servicing, you should keep your hands dry. The power cord must be unplugged to protect electrical hazards.

c) Wear gloves when assembling or disassembling the appliance to avoid being injured by a sharp edge.

3. INSTALLATION INSTRUCTIONS

a) Place the breadmaker allowing at least 4-inch air space around sides and top of the breadmaker.

b) Always place the breadmaker on a heat-proof counter top or table during operation.

c) This breadmaker must be placed on a firm, flat, and solid surface.

d) 120V/60Hz rated Bread Machine has a polarized plug : one blade is wider than the other.
230V/50Hz rated Bread Machine has to be earthed.

e) Extension cords are available and may be used if care is exercised in their use.

♦ EXTENSION CORD IS USED ♦

1. The marked electrical rating of the extension cord should be at least as great as the appliance.
2. The longer cord should be arranged so it will not drape over the counter top or tabletop where it can be pulled by children or tripped over.

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TROUBLESHOOTING GUIDE

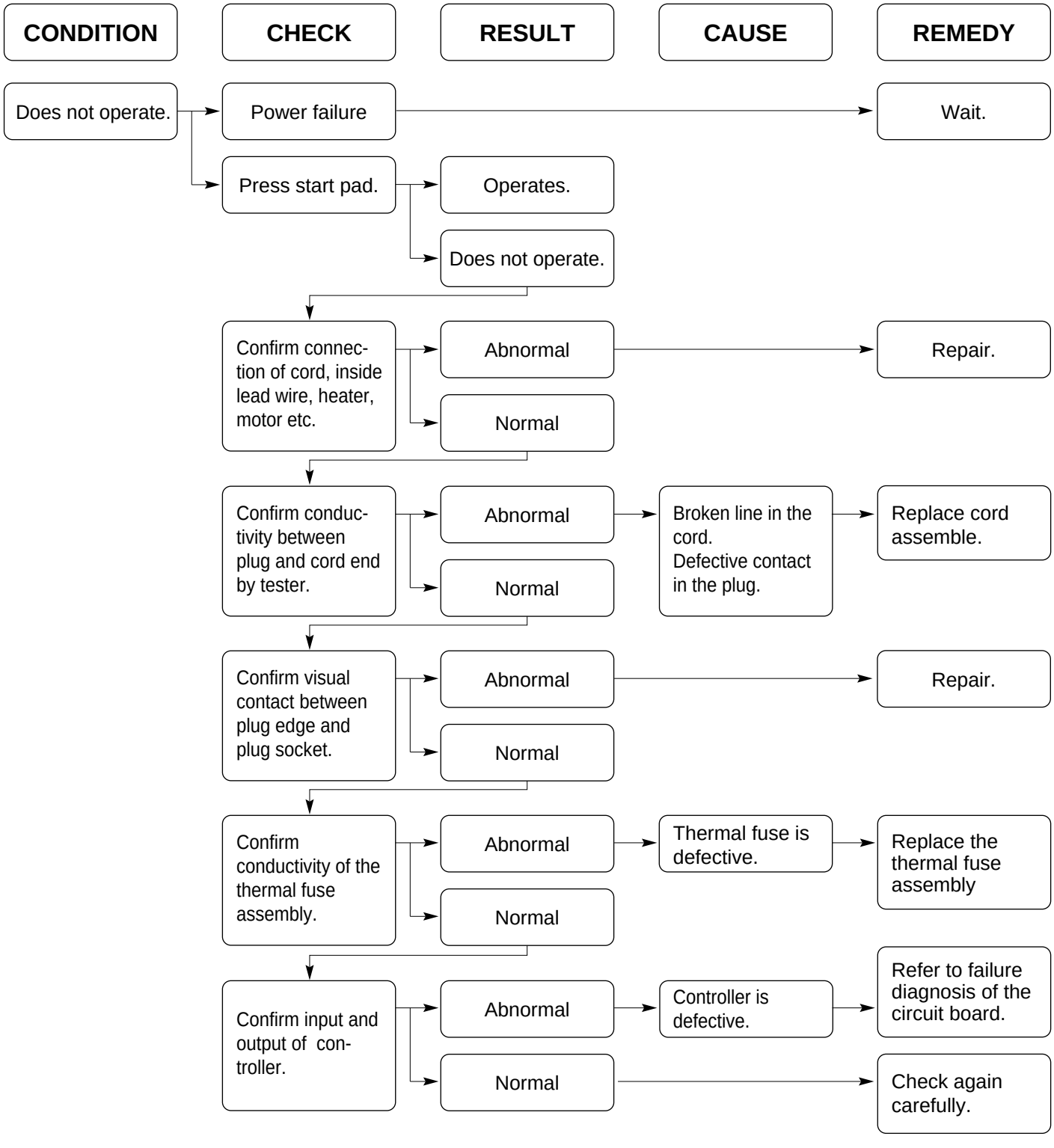
When you get a complaint from your customer, evaluate the complaint carefully before going to the customer's home. If there are the following symptoms, please instruct the customer for the proper use of the breadmaker. This can save an unnecessary service call.

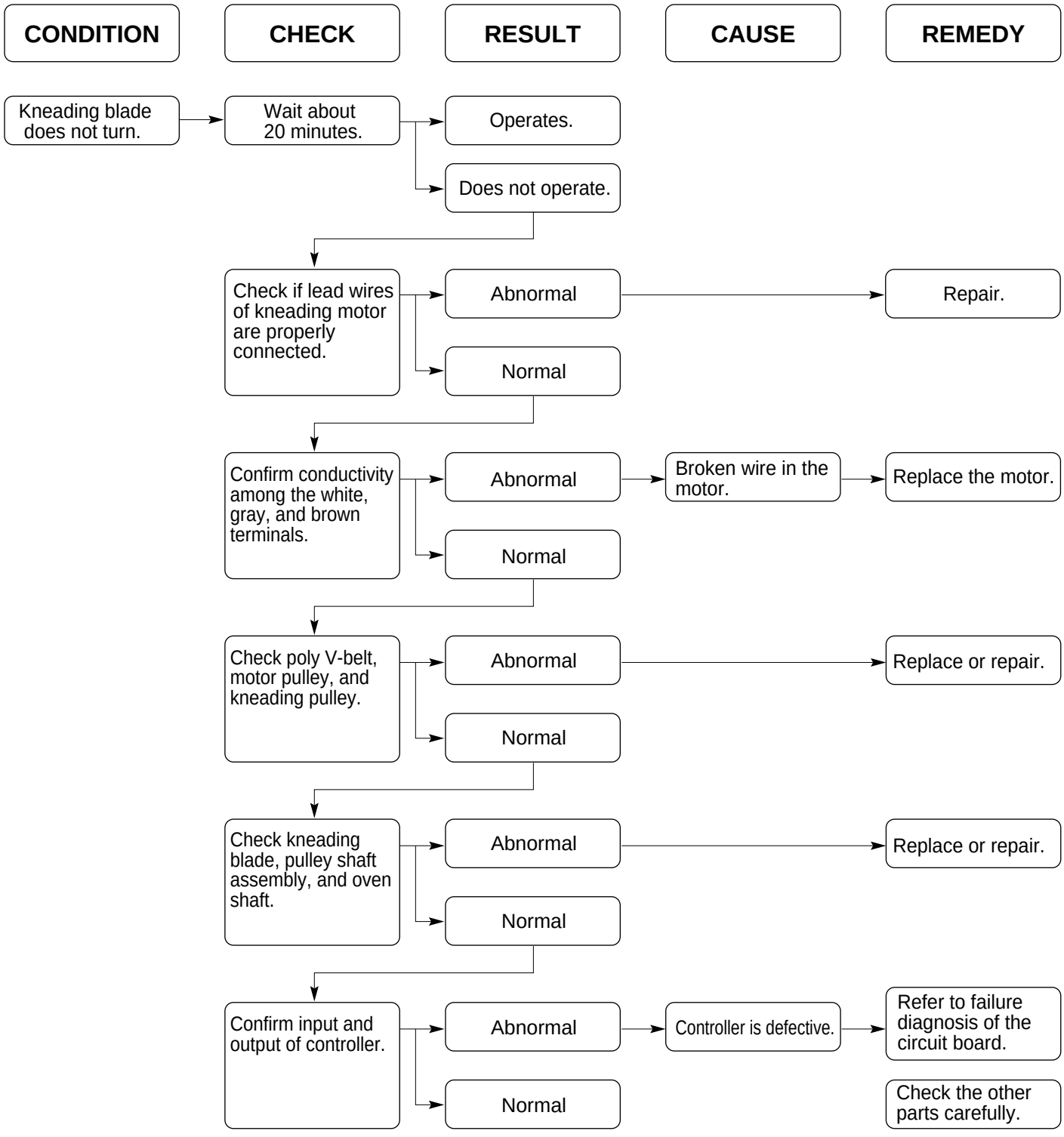
A. CHECKING POINTS BEFORE SERVICE

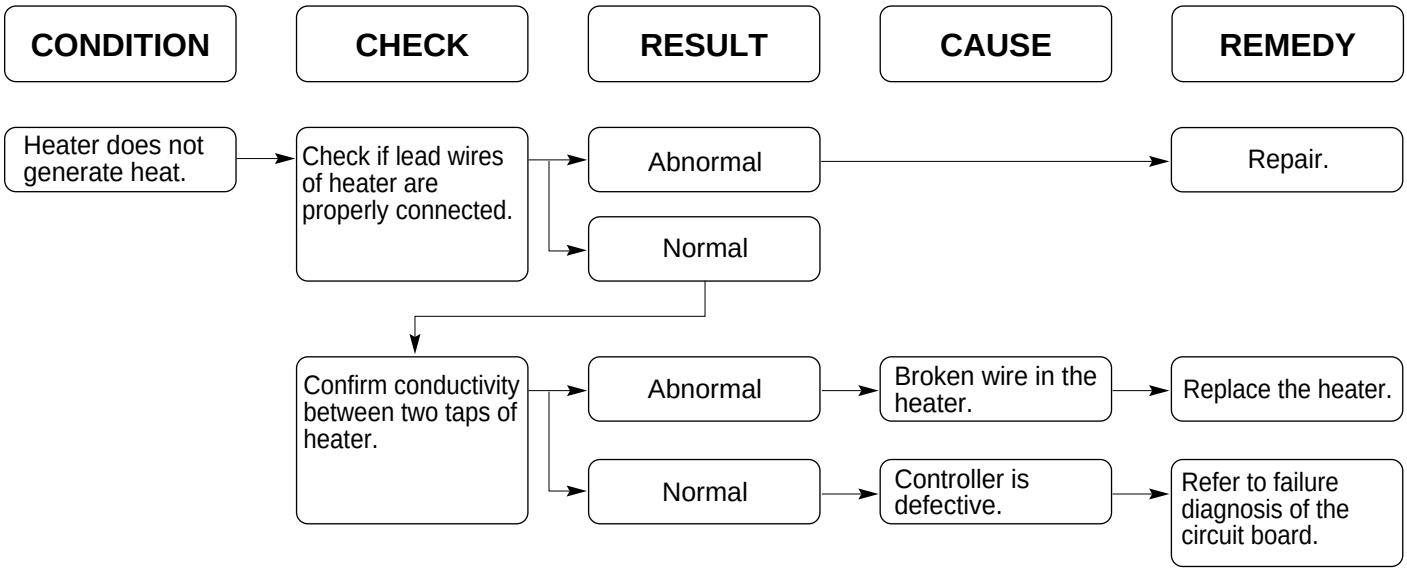
CONDITION	CAUSE	REMEDY
Breadmaker does not work.	Electric power is interrupted.	Wait.
	Remaining time display shows [HI] and does not work. (Inside of breadmaker is too hot.)	Wait until cool.
	Breadmaker plug is not Inserted tightly.	Insert breadmaker plug securely.
Breadmaker operates but does not knead.	Kneading blade is extracted.	Fix the kneading blade securely.
Breadmaker does not operate and display /A on remaining time display window after start.	Electric power has been interrupted during operation.	Empty bread pan and operate again.
A little smoke is emitted from the breadmaker.	Some material is spilled in the breadmaker when measuring ingredients.	Clean the inside of breadmaker and operate again.
Bread is not made well.	Water used is too hot or too cold.	Regulate the ingredients used. Refering the owner's manual.
	Ingredients are spoiled by being open for long time.	
	Used ingredients are not measured accurately.	

B. TROUBLESHOOTING GUIDE EXCEPT CIRCUIT BOARD

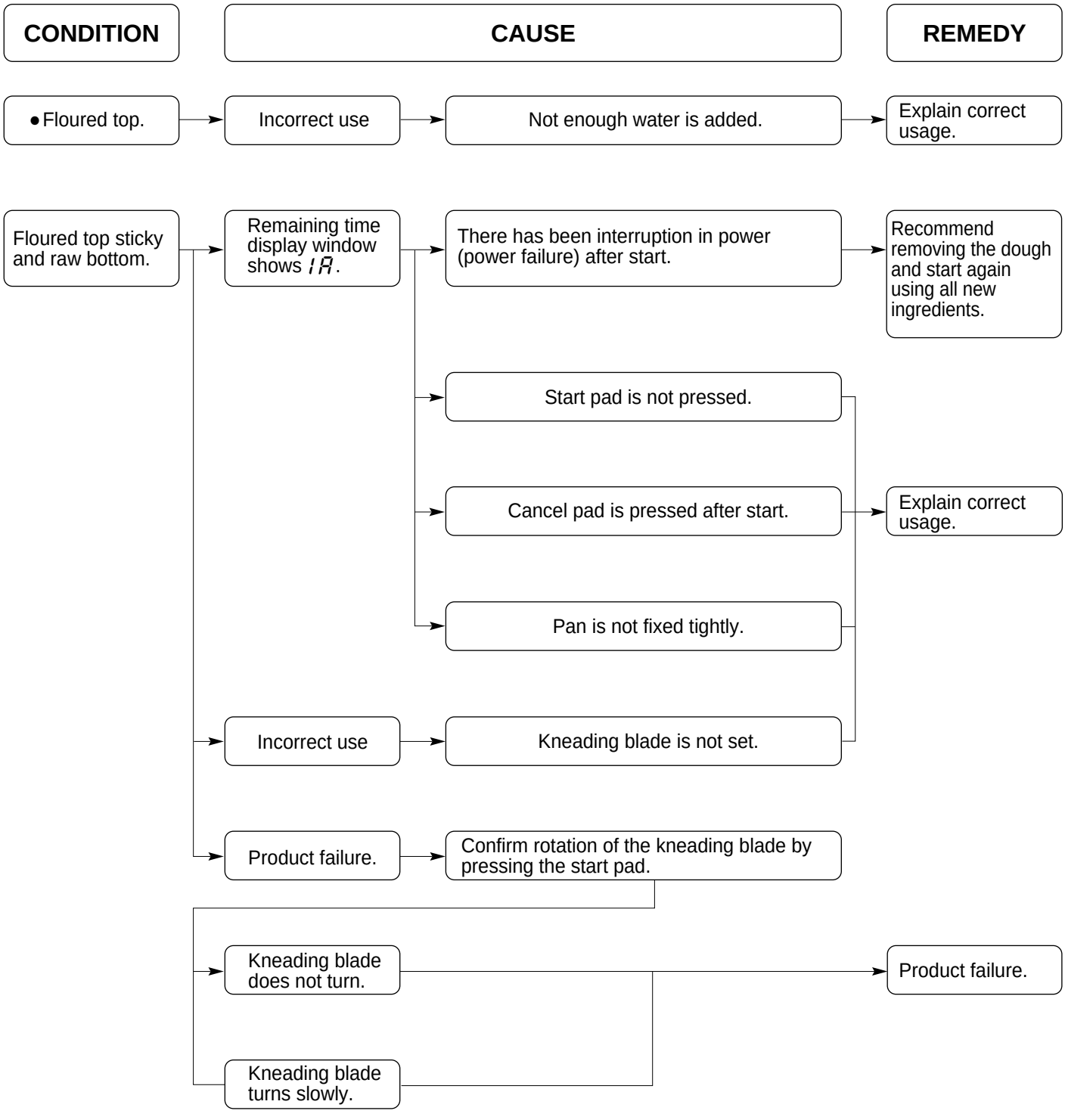
(TROUBLE 1) Breadmaker does not operate.

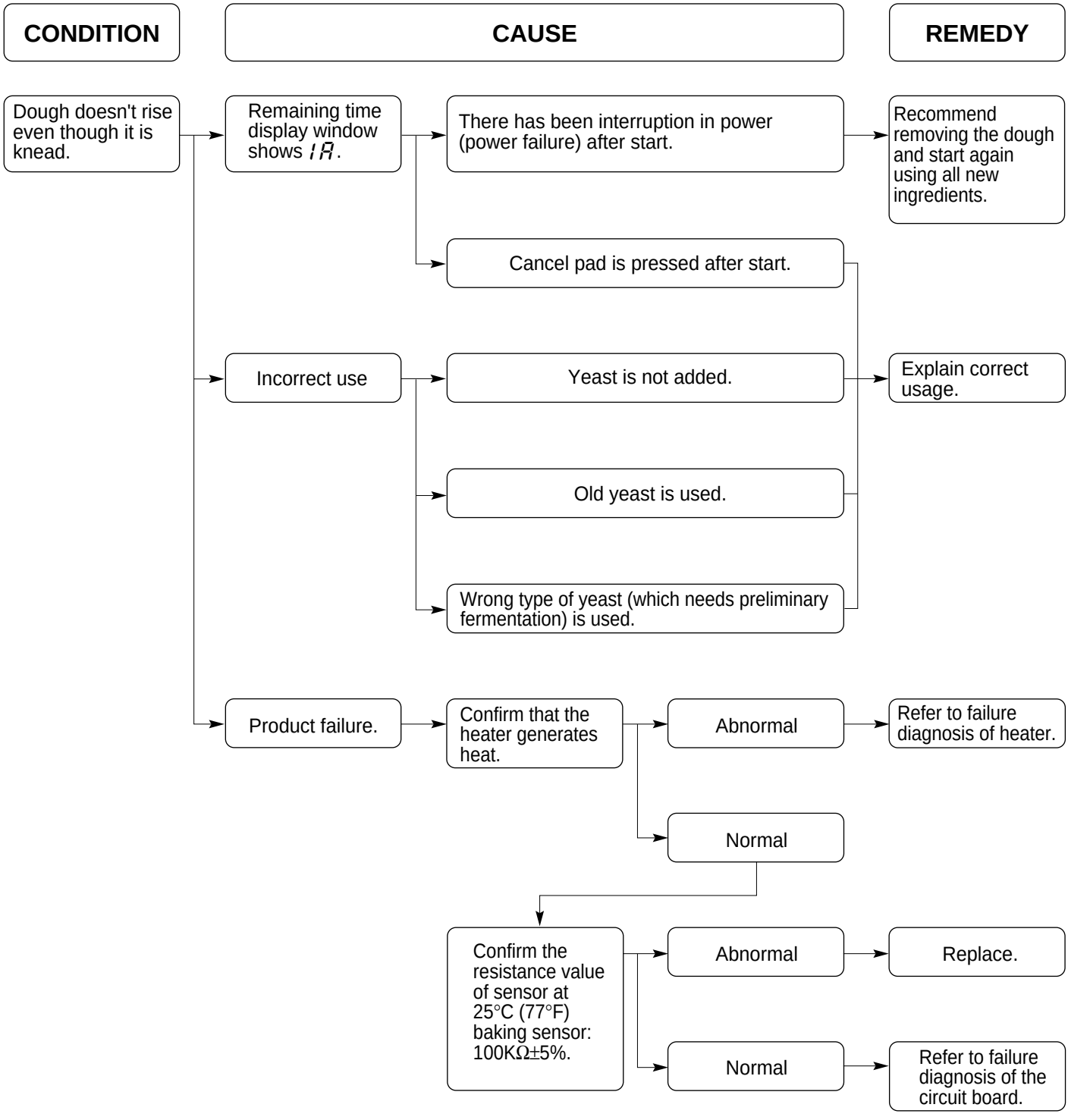


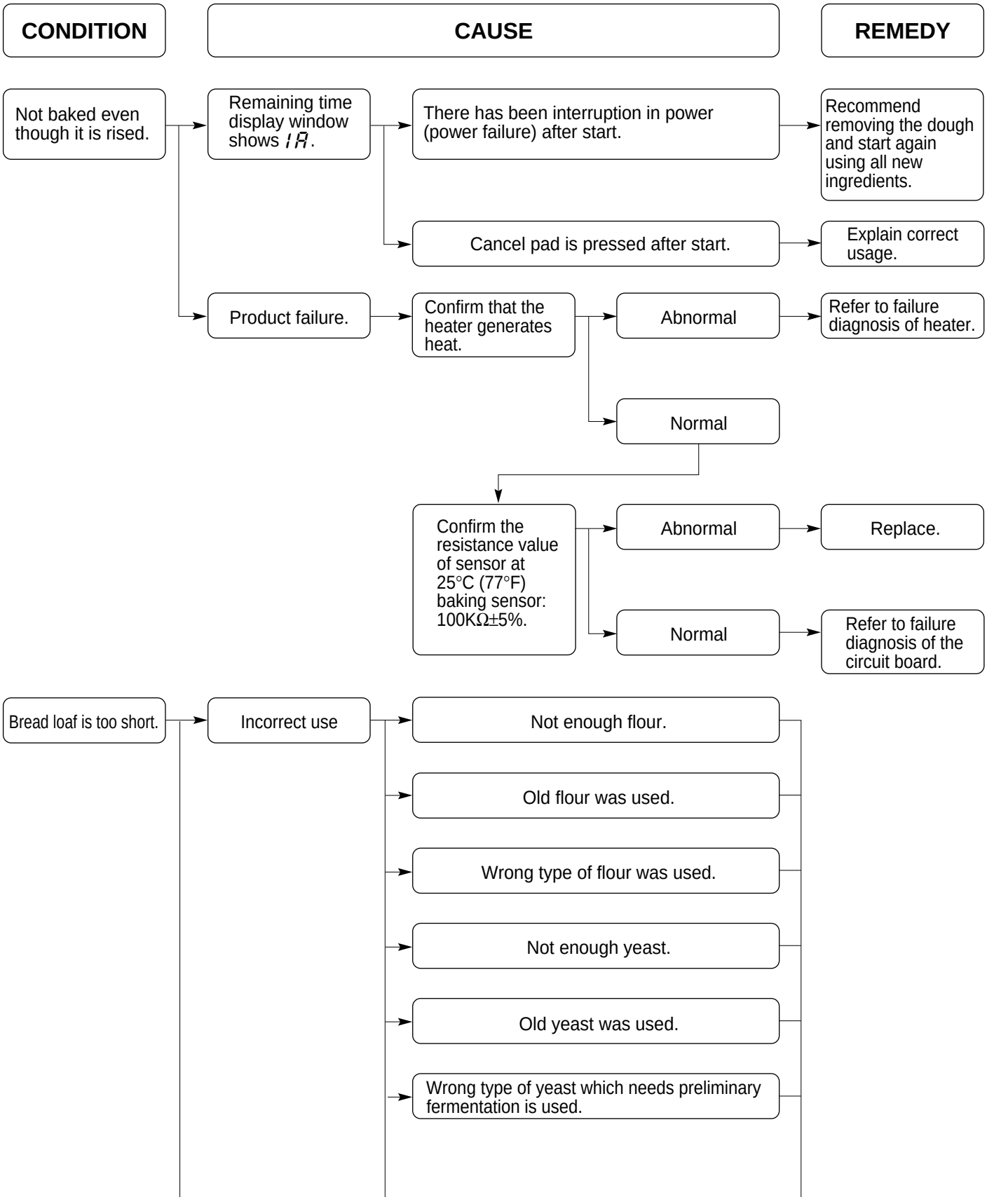

CONDITION
CHECK
RESULT
CAUSE
REMEDY
Kneading blade does not turn.
Wait about 20 minutes.
Operates.
Does not operate.
Check if lead wires of kneading motor are properly connected.
Abnormal
Repair.
Normal
Confirm conductivity among the white, gray, and brown terminals.
Abnormal
Broken wire in the motor.
Replace the motor.
Normal
Check poly V-belt, motor pulley, and kneading pulley.
Abnormal
Replace or repair.
Normal
Check kneading blade, pulley shaft assembly, and oven shaft.
Abnormal
Replace or repair.
Normal
Confirm input and output of controller.
Abnormal
Controller is defective.
Refer to failure diagnosis of the circuit board.
Normal
Check the other parts carefully.


CONDITION
CHECK
RESULT
CAUSE
REMEDY
Heater does not generate heat.
Check if lead wires of heater are properly connected.
Abnormal
Repair.
Normal
Confirm conductivity between two taps of heater.
Abnormal
Broken wire in the heater.
Replace the heater.
Normal
Controller is defective.
Refer to failure diagnosis of the circuit board.

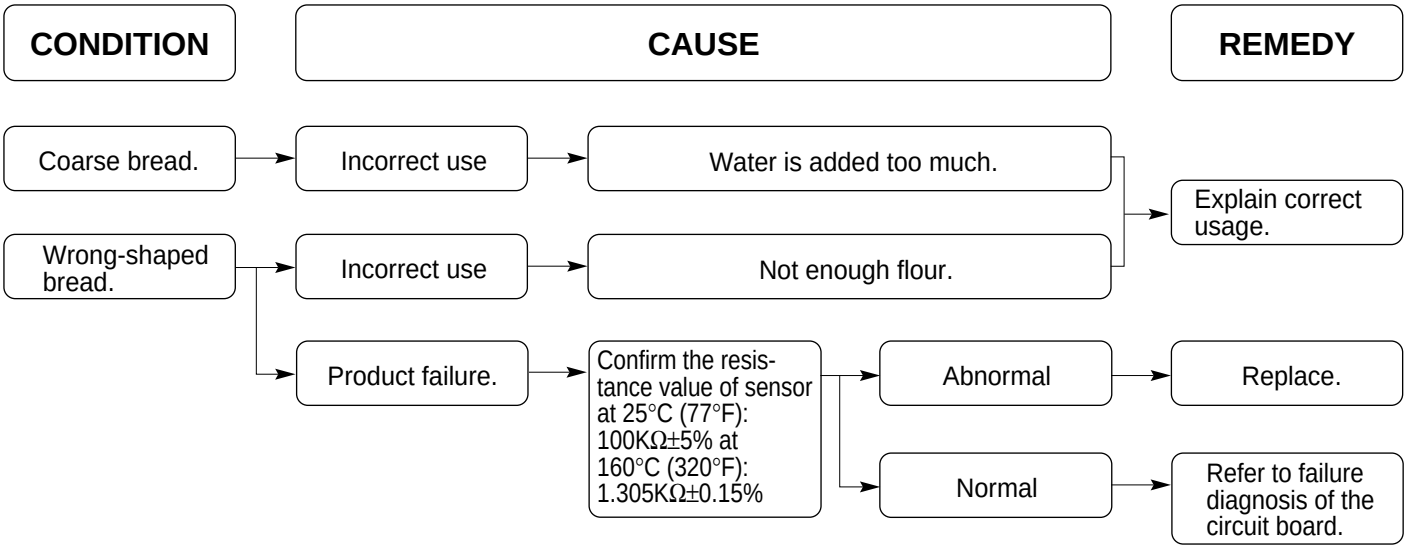
(TROUBLE 2) Poor bread is made.


CONDITION
CAUSE
REMEDY
● Floured top.
Incorrect use
Not enough water is added.
Explain correct usage.
Floured top sticky and raw bottom.
Remaining time display window shows 1A.
There has been interruption in power (power failure) after start.
Recommend removing the dough and start again using all new ingredients.
Start pad is not pressed.
Cancel pad is pressed after start.
Explain correct usage.
Pan is not fixed tightly.
Incorrect use
Kneading blade is not set.
Product failure.
Confirm rotation of the kneading blade by pressing the start pad.
Kneading blade does not turn.
Product failure.
Kneading blade turns slowly.

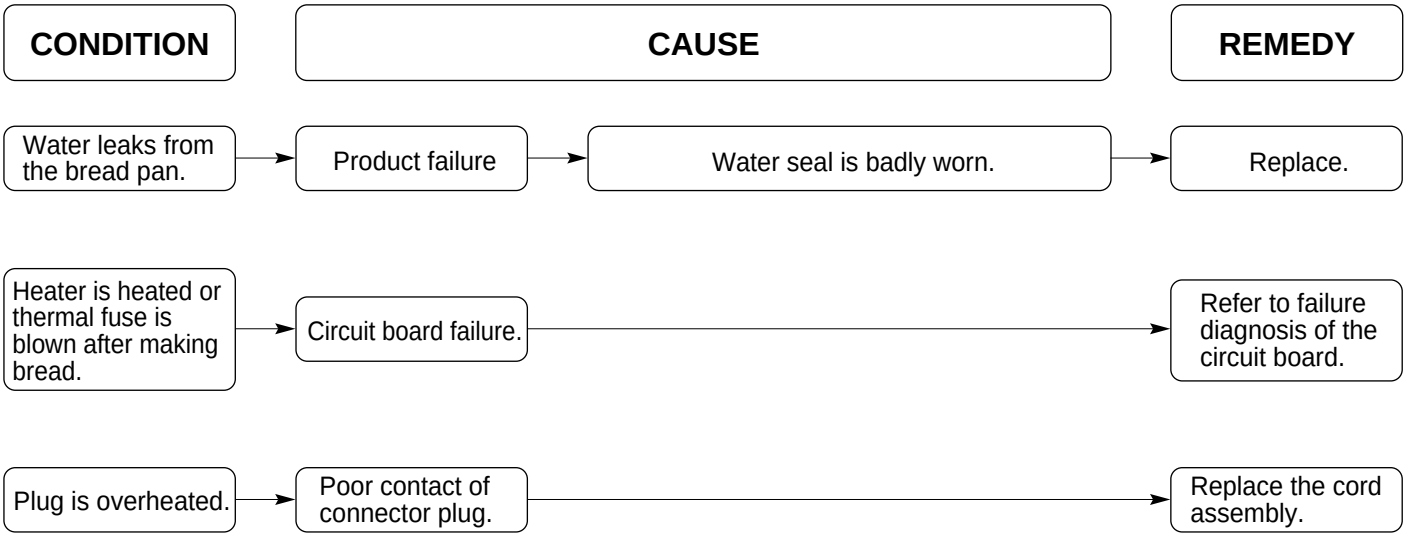

CONDITION
CAUSE
REMEDY
Dough doesn't rise even though it is knead.
Remaining time display window shows 1A.
There has been interruption in power (power failure) after start.
Recommend removing the dough and start again using all new ingredients.
Cancel pad is pressed after start.
Incorrect use
Yeast is not added.
Explain correct usage.
Old yeast is used.
Wrong type of yeast (which needs preliminary fermentation) is used.
Product failure.
Confirm that the heater generates heat.
Abnormal
Refer to failure diagnosis of heater.
Normal
Confirm the resistance value of sensor at 25°C (77°F) baking sensor: 100KΩ±5%.
Abnormal
Replace.
Normal
Refer to failure diagnosis of the circuit board.

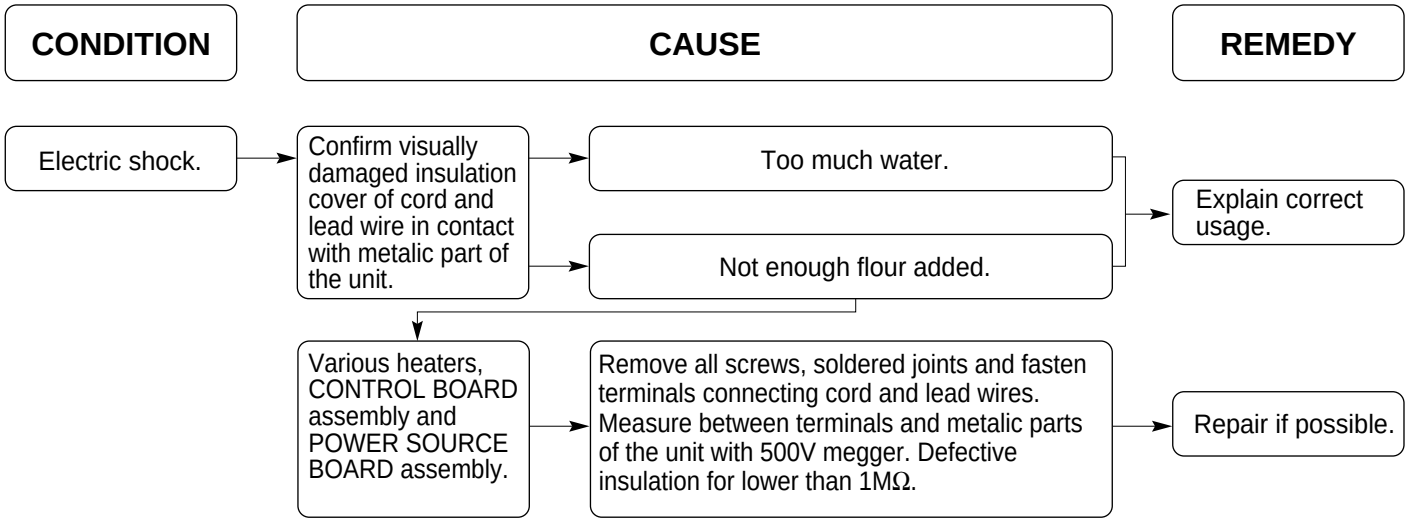

CONDITION
CAUSE
REMEDY
Not baked even though it is rised.
Remaining time display window shows 1A.
There has been interruption in power (power failure) after start.
Recommend removing the dough and start again using all new ingredients.
Cancel pad is pressed after start.
Explain correct usage.
Product failure.
Confirm that the heater generates heat.
Abnormal
Refer to failure diagnosis of heater.
Normal
Confirm the resistance value of sensor at 25°C (77°F) baking sensor: 100KΩ±5%.
Abnormal
Replace.
Normal
Refer to failure diagnosis of the circuit board.
Bread loaf is too short.
Incorrect use
Not enough flour.
Old flour was used.
Wrong type of flour was used.
Not enough yeast.
Old yeast was used.
Wrong type of yeast which needs preliminary fermentation is used.

CONDITION
CAUSE
REMEDY
Not enough flour.
Explain correct usage.
Not enough water.
The temperature of water was incorrect.
Kneading blade was not installed.
Not enough skim milk used.
Other ingredients which should not be used were added.
Product failure.
Confirm the resistance value of sensor : 100KΩ±5% at 25°C (77°F). 1.305KΩ±0.15% at 160°C (320°F).
Abnormal
Replace.
Normal
Refer to failure diagnosis of the circuit board.
Over baked.
Incorrect use
Not enough flour.
Not enough water.
The temperature of water was incorrect.
Kneading blade was not installed.
Explain correct usage.
Product failure.
Confirm the resistance value of sensor: 100KΩ±5% at 25°C (77°F). 1.305KΩ±0.15% at 160°C (320°F).
Abnormal
Replace.
Normal
Refer to failure diagnosis of the circuit board.



(TROUBLE 3) Other problems.

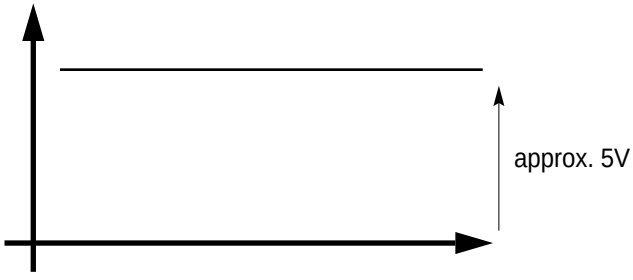
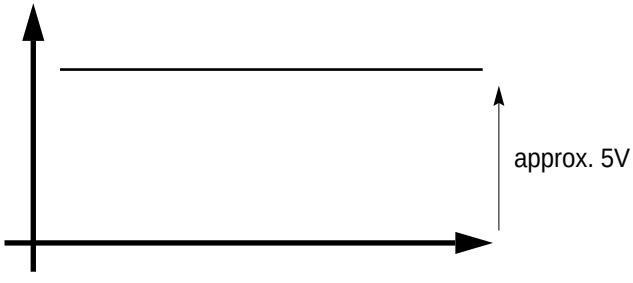


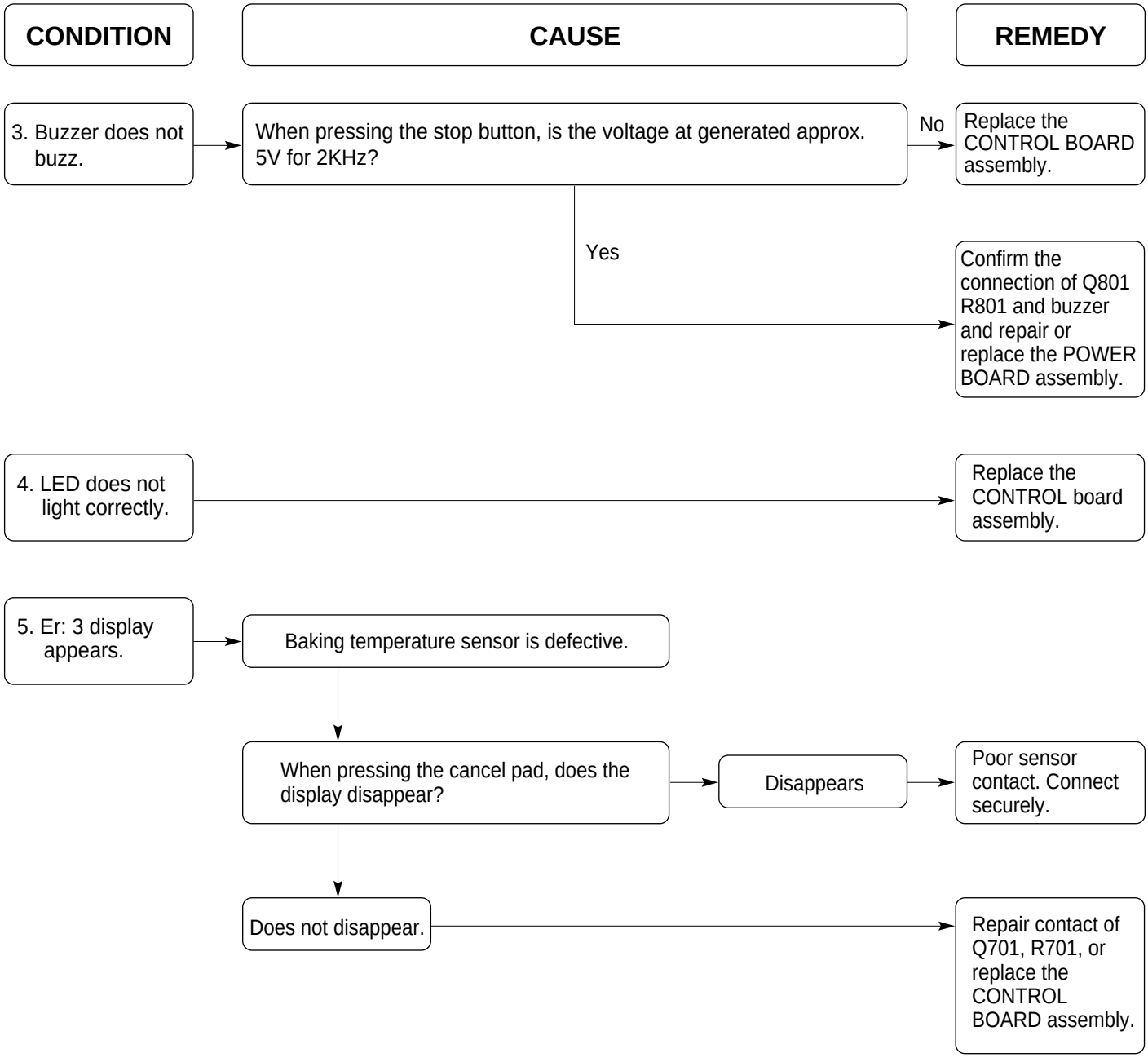

CONDITION
CAUSE
REMEDY
Electric shock.
Confirm visually damaged insulation cover of cord and lead wire in contact with metalic part of the unit.
Too much water.
Not enough flour added.
Explain correct usage.
Various heaters, CONTROL BOARD assembly and POWER SOURCE BOARD assembly.
Remove all screws, soldered joints and fasten terminals connecting cord and lead wires. Measure between terminals and metalic parts of the unit with 500V megger. Defective insulation for lower than 1MΩ.
Repair if possible.

(TROUBLE 4) Some letter is displayed on remaining time display window.

Letter	Cause	Remedy
H 1	The temperature of oven area is too hot. (higher than 40°C/104°F)	Press CANCEL pad for cooling and start again.
E-3	Baking sensor is defective (Resistance value is not 100KΩ±5% at 25°C (77°F): and 1.305KΩ±0.15% at 160°C (320°F)):	Repair or replace.

C. FAILURE DIAGNOSIS OF THE CIRCUIT BOARD

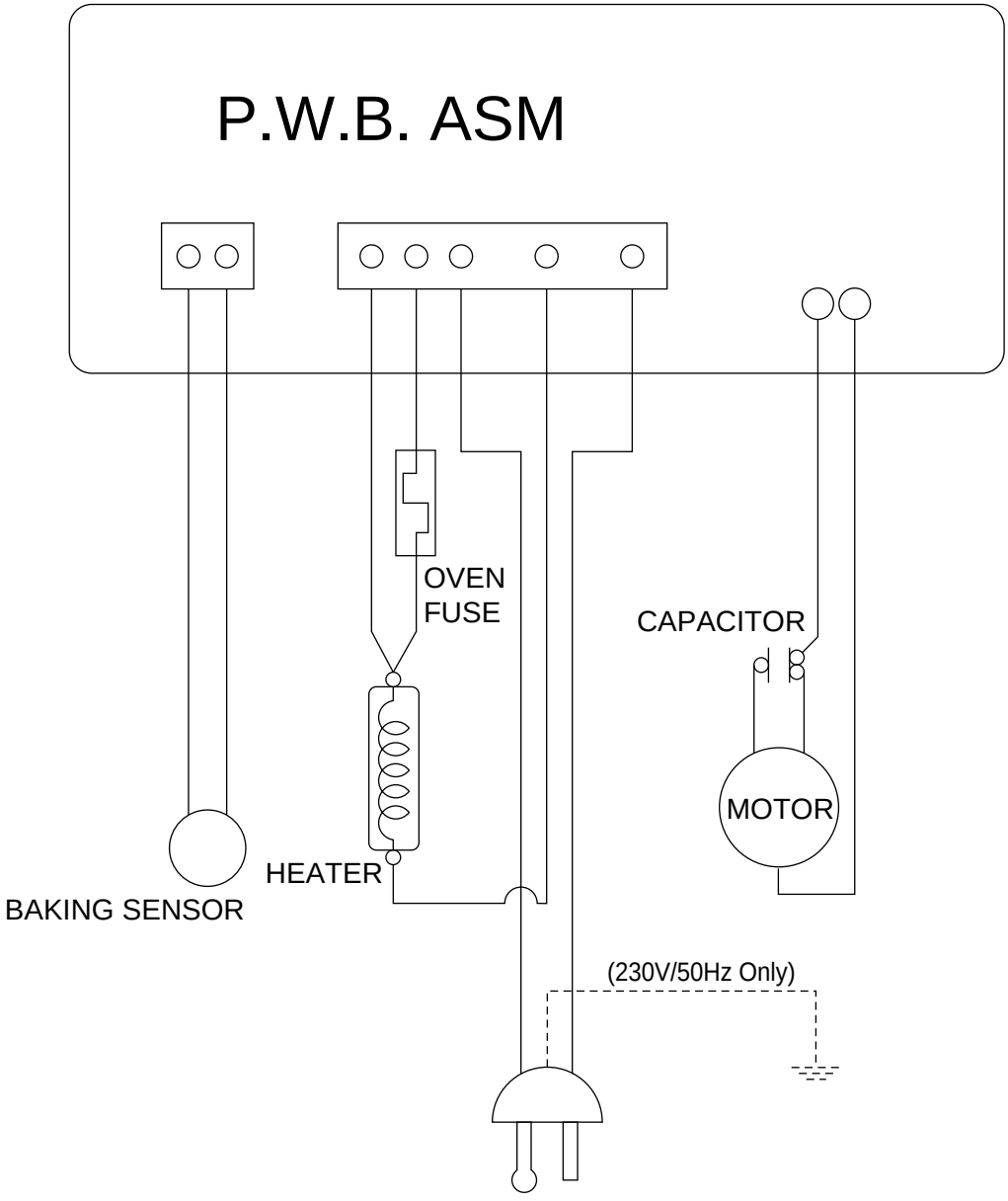
CONDITION	CAUSE	REMEDY
1. Kneading motor does not turn.	See page 9 (OPERATION CHECK)	
	Is the signal generated at pin No. 26 of IC1 as follows? 	Yes → Confirm the connection of Q601 R601 and repair or replace the POWER SOURCE BOARD assembly.
		No → Replace the CONTROL board assembly.
2. Main heater does not generate.	See page 9 (OPERATION CHECK)	
	Is the signal generated at pin No. 27 of IC1 as follows? 	Yes → Confirm connection of Q602, R602 repair or replace the POWER SOURCE BOARD assembly.
		No → Replace the CONTROL board assembly.


CONDITION
CAUSE
REMEDY
3. Buzzer does not buzz.
When pressing the stop button, is the voltage at generated approx. 5V for 2KHz?
No
Replace the CONTROL BOARD assembly.
Yes
Confirm the connection of Q801 R801 and buzzer and repair or replace the POWER BOARD assembly.
4. LED does not light correctly.
Replace the CONTROL board assembly.
5. Er: 3 display appears.
Baking temperature sensor is defective.
When pressing the cancel pad, does the display disappear?
Disappears
Poor sensor contact. Connect securely.
Does not disappear.
Repair contact of Q701, R701, or replace the CONTROL BOARD assembly.

4. SPECIFICATIONS

DESCRIPTION		AUTOMATIC BREADMAKER
MODEL		REFER TO THE COVER PAGE
POWER SUPPLY		INDICATED ON THE RATING LABEL
POWER CONSUMPTION	MAIN HEATER	550W
	KNEADING MOTOR	100W/110W
DIMENSIONS(W × D × H)		APPROX. 13 3/4" × 9" × 13" (35 × 23 × 33cm)
WEIGHT		APPROX. 13.9lb.(6.3kg)
TIMER		4:10 TO 13:00 HOURS DIGITAL TIMER
CORD LENGTH		APPROX. 3 FEET, 3.4 INCHES (1.0m)
THERMAL FUSE	MAIN HEATER PROTECTOR	291°F/144°C
	KNEADING MOTOR PROTECTOR	248°F/120°C, 130°C
ACCESSORIES		MEASURING CUP, MEASURING SPOON(OPTION) VIDEO TAPE (OPTION)
SERIAL NO.		INDICATED ON THE RATING LABEL WITH PERMANENT INK

BLOCK DIAGRAM



REMARKS

1. ▭ :HOUSING
2. ▭○○○ :TERMINAL BLOCK
3. ○ :RECEPTACLE & TAP

DISASSEMBLY INSTRUCTION

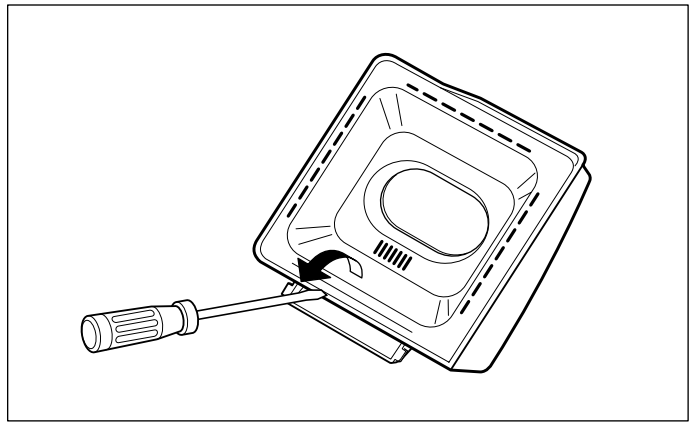
• PAY ATTENTION TO THE FOLLOWING IN SERVICE AND INSPECTION.

(a) Protect against electric shock:
Pull out the plug for service and inspection. Don't touch live components when service and inspection are made.

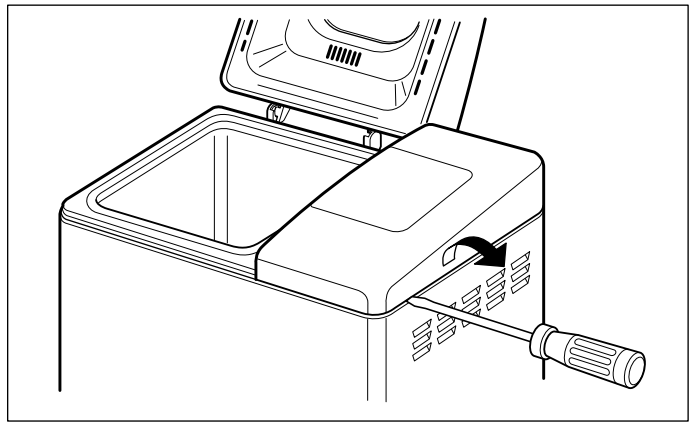
(b) Restore the original conditions of components and wire layout; Safety provisions are made by using tube and the other insulation material and by preventing wire from contact with heat generating or movable components by means of layout and binding. They should be restored to the original conditions.

(c) Safety inspection after service is required as follows: confirm that screws, nuts, components, and wires removed for service are restored. Check the deterioration around service components, and check for insulation.

1. Turn the Top Cover assembly upside down and pull out the inner cover and the viewing window.

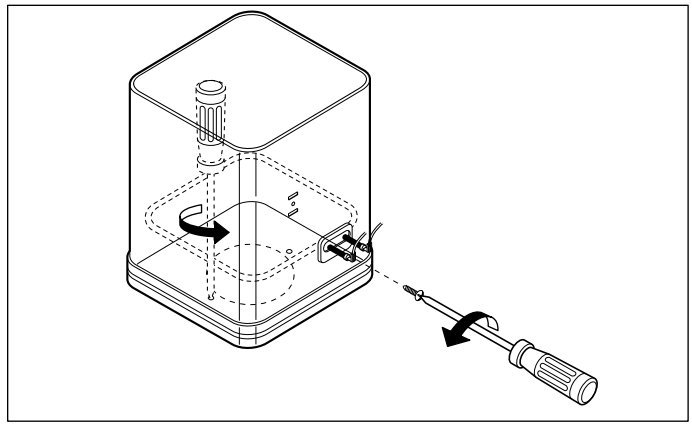


2. Pull out the control panel.

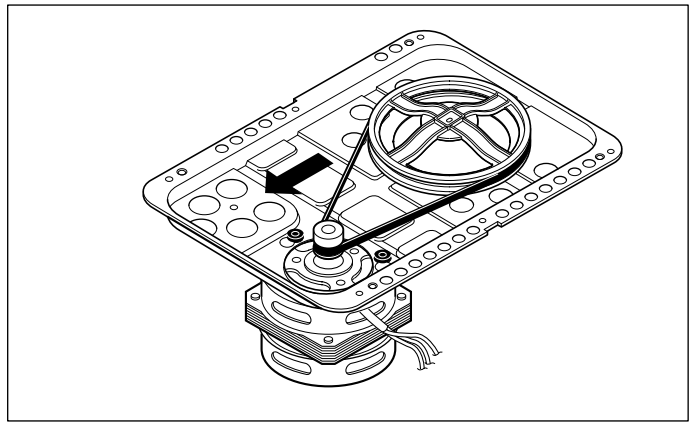


3. After disconnecting leads, remove the oven case main assembly from the chassis by unscrewing two machine screws fixing oven case main assembly.

4. Remove the leadwire assembly and sheath heater assembly from the oven case main assembly.



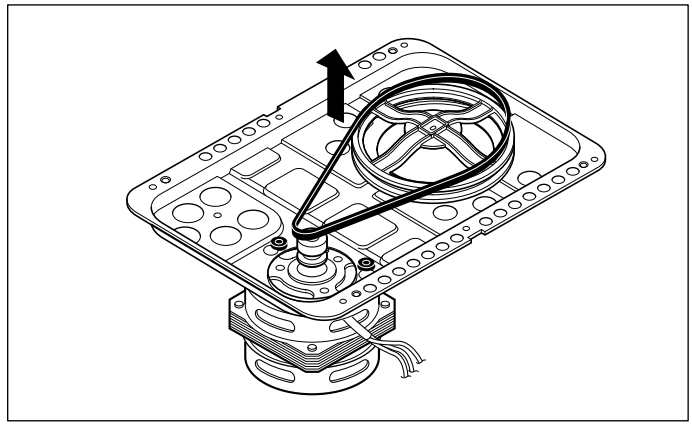
5. Turn the breadmaker upside down. Remove four legs and base cover by unscrewing. Pull out the power cord assembly on the bottom of the unit. Remove the chassis assembly from the out case.



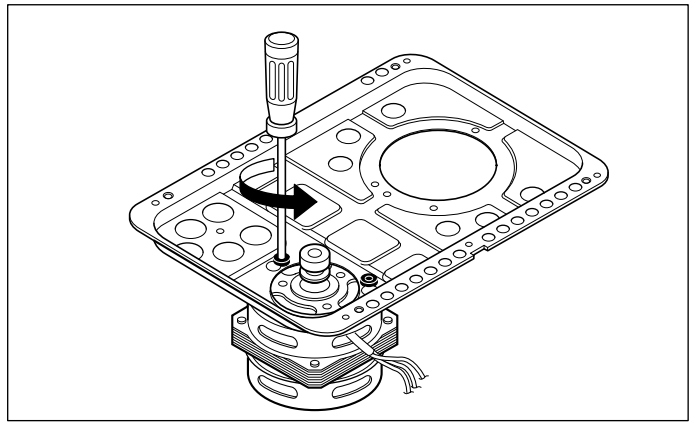
6. Remove the poly V-belt.

Remove nut and pulley washer, then kneading pulley can be disconnected.

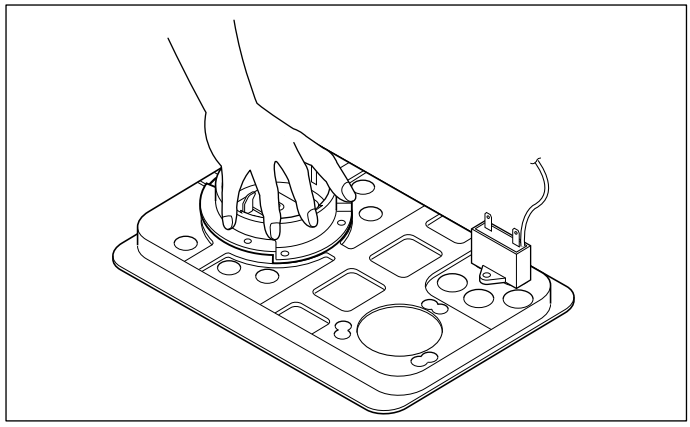
Remove the E-ring, washer, and pulley shaft assembly.



7. Remove the motor pulley from the motor shaft by removing one machine screw. Remove three fixing screws, then the kneading motor and motor cushion can be disassembled.

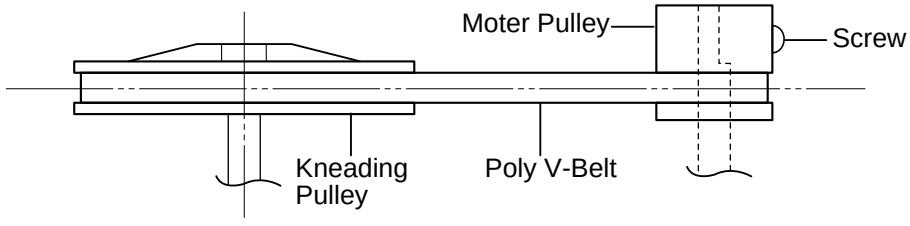


8. Turn the chassis upside down and remove the oven base and the capacitor.



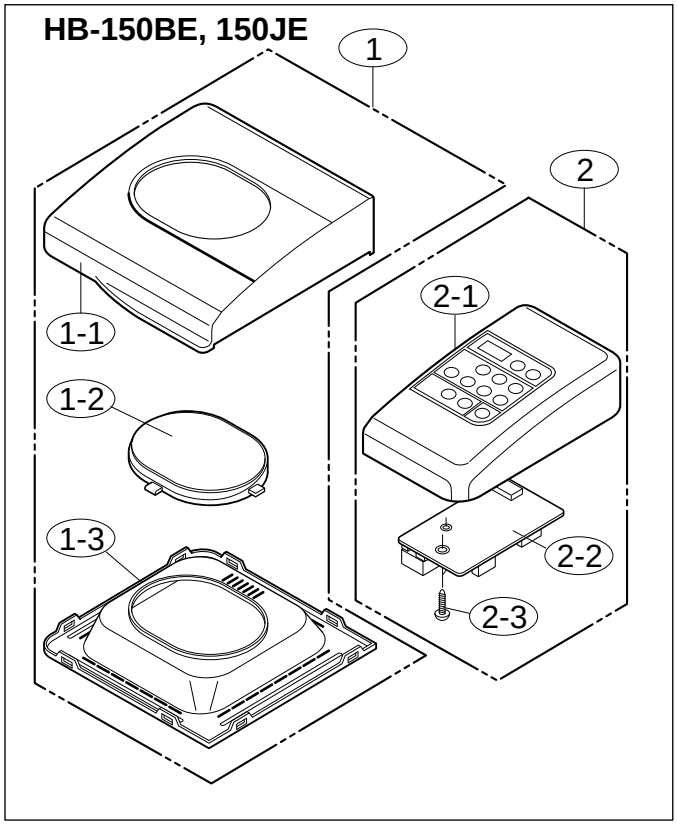
CAUTION

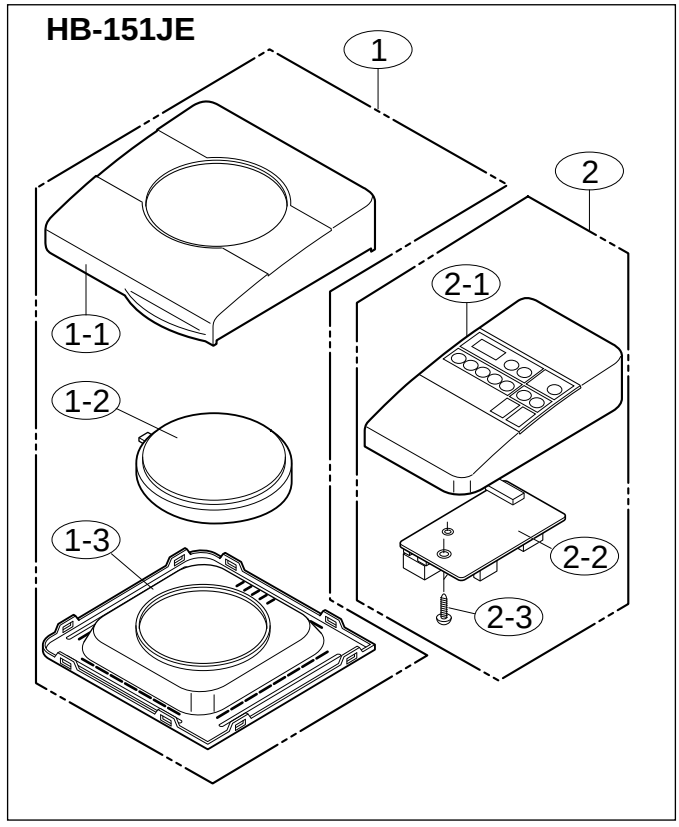
When you reassemble the kneading pulley, poly V-belt, and motor pulley after service or repair; adjust the center of the kneading pulley, poly V-belt, and motor pulley as follows.

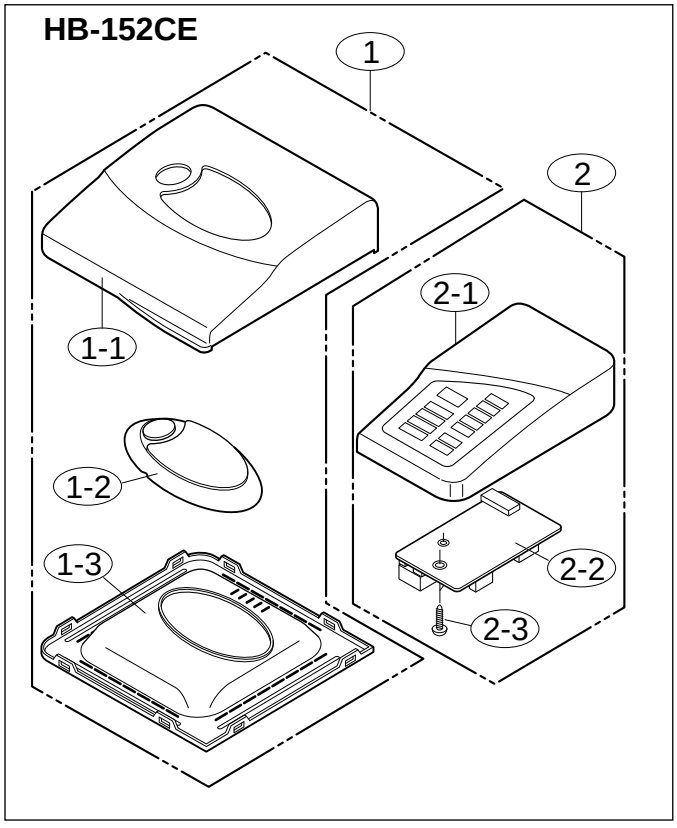


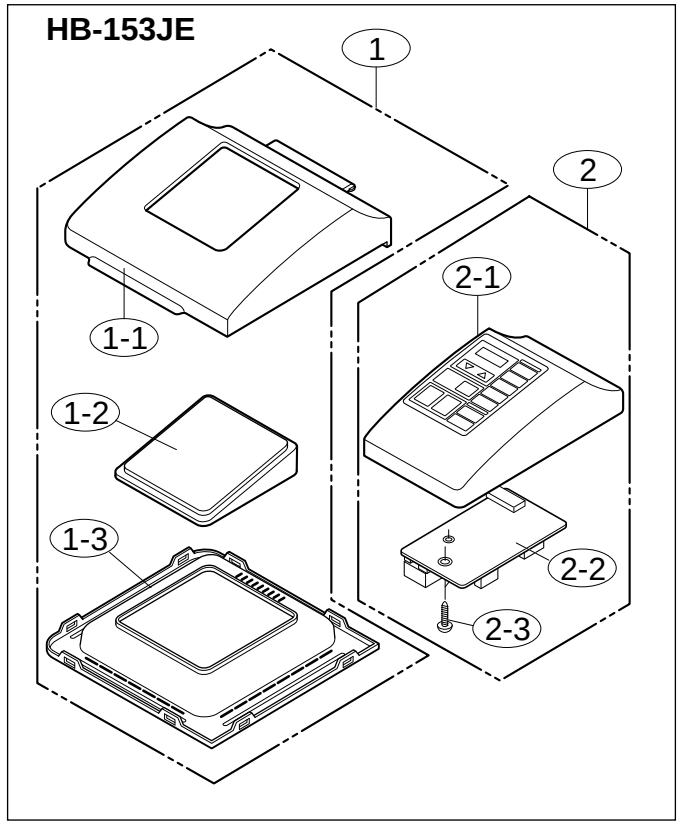
EXPLODED VIEW & PARTS LIST

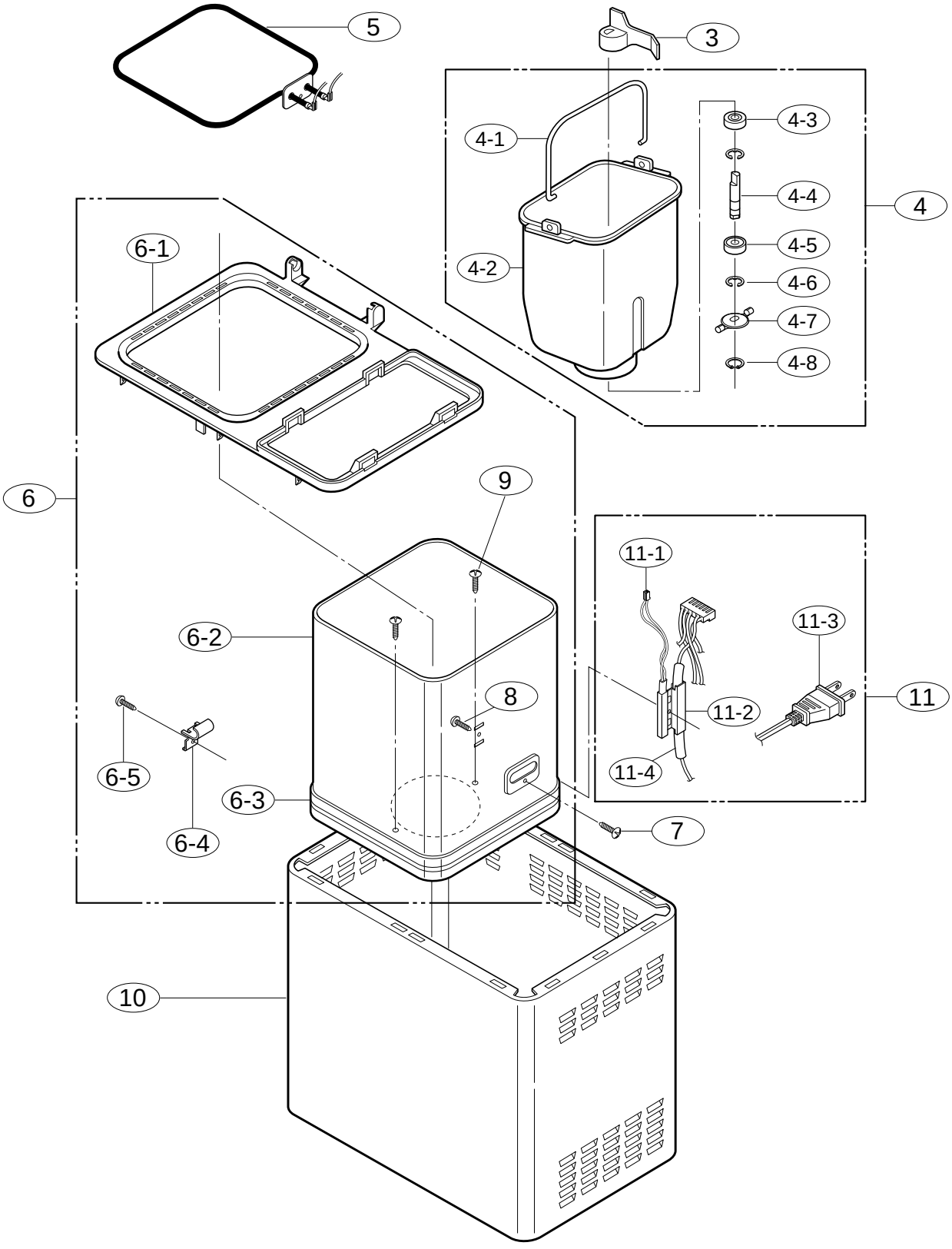
A. EXPLODED VIEW







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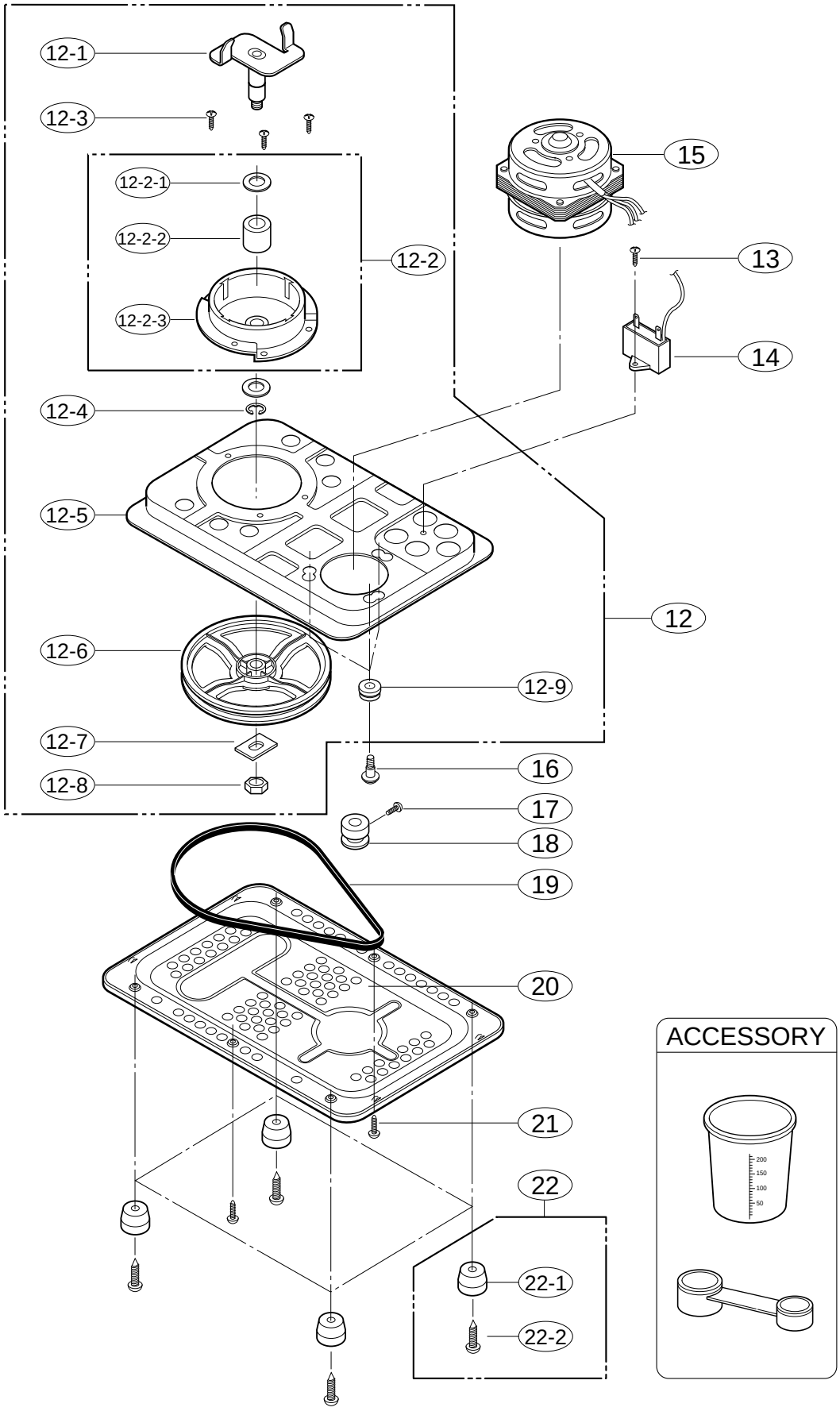
12-1
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12-2-1
12-2-2
12-2-3
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22-1
22-2
ACCESSORY

B. PARTS LIST

NSP : NOT SERVICEABLE PARTS

LOCA. No.	DESCRIPTION	PART No.				Q'TY	SVC MARK	REMARKS
		HB-150E	HB-151E	HB-152E	HB-153E			
1	TOP COVER ASM	3551FB2072A	3551FB2073A	3551FB2077A	3551FB2085A	1		
1-1	TOP COVER	3122FB1043A	3122FB1046A	3122FB1048A	3122FB1051A	1	NSP	
1-2	VIEWING WINDOW	3790FB2063A	3790FB2070A	3790FB3085A	3790FB2080A	1	NSP	
1-3	INNER COVER	3550FB1044A	3550FB1047A	3550FB2068A	3550FB2081A	1	NSP	
2	CONTROLLER ASM				4781FB2086A		NSP	100V/50Hz,JE
					4781FB2086B		NSP	100V/60Hz,JE
		4781FB2065A					NSP	120V/60Hz,BE
		4781FB2065B	4781FB2083A			1	NSP	120V/60Hz,JE
				4781FB2084A			NSP	120V/60Hz,CE
			4781FB2083C				NSP	230V/50Hz,JE
		4781FB2065C		4781FB2084B			NSP	230V/50Hz,CE
2-1	CONTROL PANEL	3572FB1042A	3572FB1041A	3572FB1049A	3572FB1052A	1		
2-2	P.W.B. ASM				6871FX1005F			100V/50Hz,JE
					6871FX1005G			100V/60Hz,JE
		6871FX1001A						120V/60Hz,BE
		6871FX1001E	6871FX1004A		6871FX1005A			120V/60Hz,JE
				6871FX1002A		1		120V/60Hz,CE
		6871FX1001C	6871FX1004C	6871FX1002E	6871FX1005C			230V/50Hz,JE
		6871FX1017C		6871FX1002C				230V/50Hz,CE
				6871FX1002F				230V/50Hz,CE(CHA1)
2-3	RELAY	6920FX5003A				1		
		CQ65115D						
2-4	SCREW	1TTL0402818				2	NSP	D4×L12
3	KNEADING BLADE	5832FB3011A				1		
4	OVEN ASM	5306FB2074A				1		
4-1	OVEN HANDLE	3650FB4015A				1		
4-2	OVEN	5306FB1065A				1	NSP	
4-3	WATER SEAL	4036FB4082A				1	NSP	230V/50Hz
4-4	OVEN SHAFT	4370FB4081A				1	NSP	
4-5	BALL BEARING	4280FB4016A				1	NSP	230V/50Hz
4-6	E-RING	4O80070A				2	NSP	
4-7	OVEN ARM	4260FB4085A				1	NSP	
4-8	C-RING					1	NSP	
5	HEATER ASM	5301FB2059A						120V/60Hz
		5301FB2059B				1		230V/50Hz
		5301FB2059D						100V/50Hz
6	OVEN CASE ASM	3111FB2057B				1		
6-1	RIM	3062FB1037B				1	NSP	
6-2	OVEN CASE-M	3110FB1039A					NSP	
6-3	OVEN CASE-L	3110FB2056A					NSP	

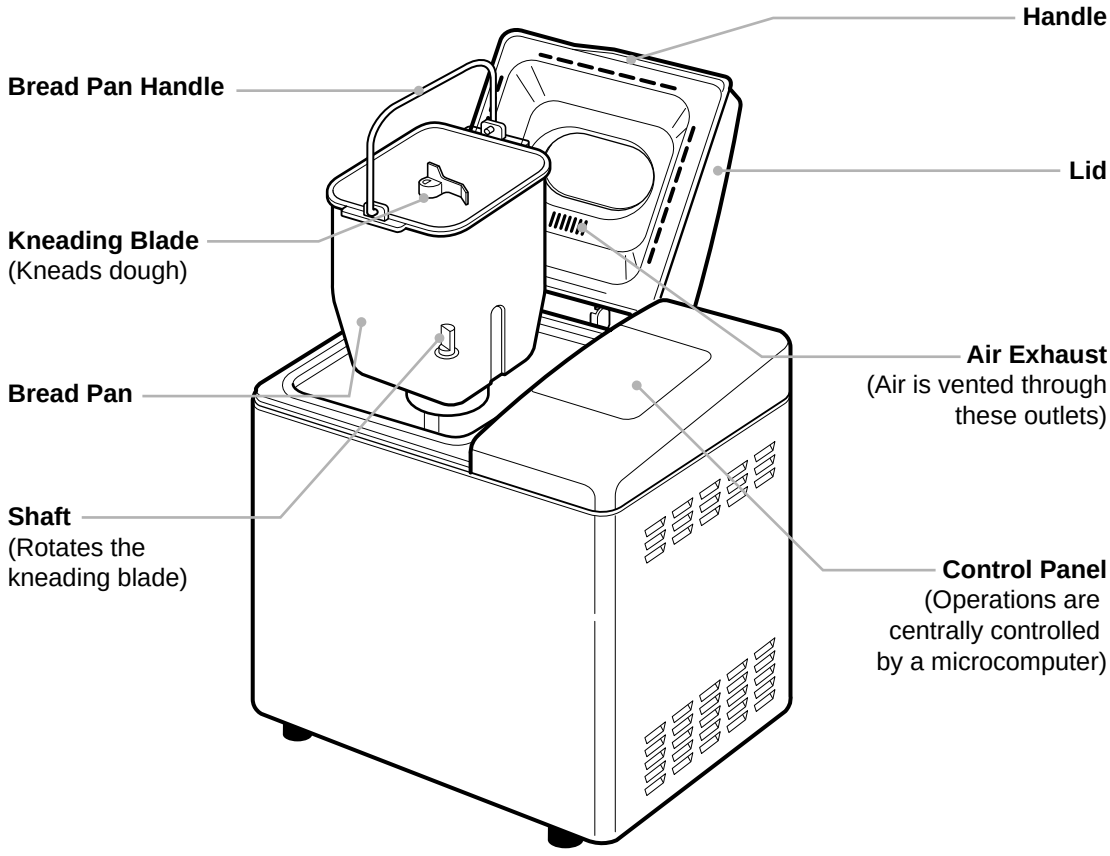
LOCA. No.	DESCRIPTION	PART No.				Q'TY	SVC MARK	REMARKS
		HB-150E	HB-151E	HB-152E	HB-153E			
6-4	HEATER HOLDER	4930FB4072A				1	NSP	
6-5	SCREW	1MPC0402422				1	NSP	
7	SCREW	1MPC0402222				1	NSP	
8	SCREW	1TPL0402422				1	NSP	
9	SCREW	1TPL0402422				2	NSP	
10	OUT CASE	3112FB1038A				1		
11	LEADWIRE ASM	6877FB2067A				1		120V/60Hz
		6877FB2067C						100V/50,60Hz
		6877FB2108A						230V/50Hz
		6877FB2108C						230V/50Hz(SWISS)
		6877FB2108D						230V/50Hz(U.K.)
11-1	BAKING SENSOR ASM	6501FB3079A				1	NSP	
11-2	FUSE BRACKET	4810FB4074A				1	NSP	
11-3	POWER CORD ASM	6411FB3082A				1	NSP	120V/60Hz
		6411FB3097A					NSP	230V/50Hz
		6411FB3104B					NSP	230V/50Hz(SWISS)
		6411FB3104C						230V/50Hz(U.K.)
		6411FB3107A					NSP	100V/50,60Hz
11-4	THERMAL FUSE	0FBZFB3084A				1	NSP	
12	CHASSIS ASM	3141FB2058A				1		NO TAPPING(120V)
		3141FB2058B						TAPPING(230V)
12-1	PULLEY SHAFT ASM	4371FB3078A				1		
12-2	OVEN BASE ASM	3040FB5061C				1		
12-2-1	WASHER-X	4O20017F				2	NSP	
12-2-2	OILLESS BEARING	4280FB4078A				1	NSP	
12-2-3	OVEN BASE	3040FB3077A				1	NSP	
12-3	SCREW	1TPL0402618				3	NSP	
12-4	E-RING	4O80070A				1	NSP	
12-5	CHASSIS	3140FB1040A				1	NSP	NO TAPPING(120V)
		3140FB1040B					NSP	TAPPING(230V)
12-6	KNEADING PULLEY	4560FB2060A				1		
12-7	PULLEY WASHER	4O80012A				1	NSP	
12-8	NUT	1NHA0500018				1	NSP	
12-9	MOTOR CUSHION	4O80051A				3	NSP	
13	SCREW	1TTL0402622				1	NSP	
14	CAPACITOR	6120FB3087A				1		100μF(120V)
		6120FB3087B						8μF(230V)
15	KNEADING MOTOR	4681FB2012F				1		120V/60Hz
		4681FB2012H						230V/50Hz
		4681FB2012K						100v/50,60Hz

LOCA. No.	DESCRIPTION	PART No.				Q'TY	SVC MARK	REMARKS
		HB-150E	HB-151E	HB-152E	HB-153E			
16	FIXING SCREW	4000FB4022A				3		
17	SCREW	1MPC0402618				1	NSP	
18	MOTOR PULLEY	4O80018A				1		
19	V-BELT	4400FB3086A				1		
20	BASE COVER	3550FB2061A				1		
21	SCREW	1TTL0402622				2	NSP	
22	LEG ASM	4O80144B				4		
22-1	LEG	4778FB4069A				4	NSP	
22-2	SCREW	4000FB4071B				4	NSP	
	MEASURING CUP	4080018A				1		OPTIONAL
	MEASURING SPOON	4080080A				1		OPTIONAL

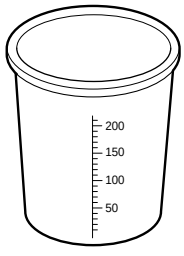
OPERATING INSTRUCTIONS

1. FEATURES AND CONTROL PANEL

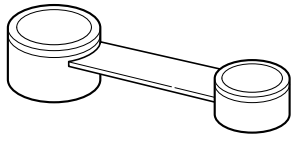
A. FEATURES



ACCESSORIES



Measuring Cup



Measuring Spoon (OPTION)

B. CONTROL PANEL

❋ Control panel layout may vary according to the model

REMAINING TIME INDICATOR

This displays the remaining time for the program to be completed.

BREAD PROGRAM INDICATOR

When PROGRAM SELECT pad is pressed, BREAD PROGRAM INDICATOR will display 1, 2, ...6 or 7 to indicate the selected program. After START pad is pressed, the indicator will disappear.

BAKING CONTROL INDICATOR

When BAKING CONTROL pad is pressed, BAKING CONTROL INDICATOR will display A, B, or C to indicate the selected baking control. After START pad is pressed, the indicator will disappear.

BAKING CONTROL

Press this pad to select dark, medium, or light crust.

TIMER

Press timer pad to set the time delay. The time will advance in 10 minutes interval from 4:10 to 13:00. This timer can not be used for BUTTER or CAKE or JAM program.

PROGRAM SELECT

Press this pad to select the program :

1. BASIC BREAD
2. SPECIALTY BREAD
3. WHOLE WHEAT
4. FRENCH BREAD
5. RAPID BREAD
6. DOUGH
7. BUTTER(for HB-150BE)
   JAM(for HB-150JE, 151JE, 152JE, 153JE)
   CAKE(for HB-150CE, 152CE)

CANCEL or STOP

Press this pad to cancel a program. If you make a mistake when setting the delay timer, program, or baking control, press CANCEL pad and reenter the correct program.

START

After setting the desired program, the baking control and timer(if needed), press this pad to start the program or timer count down.

NOTE

If you want to cancel the selected program, press the CANCEL pad for more than 1 second at any time during the cycle.

2. OPERATION CHECK

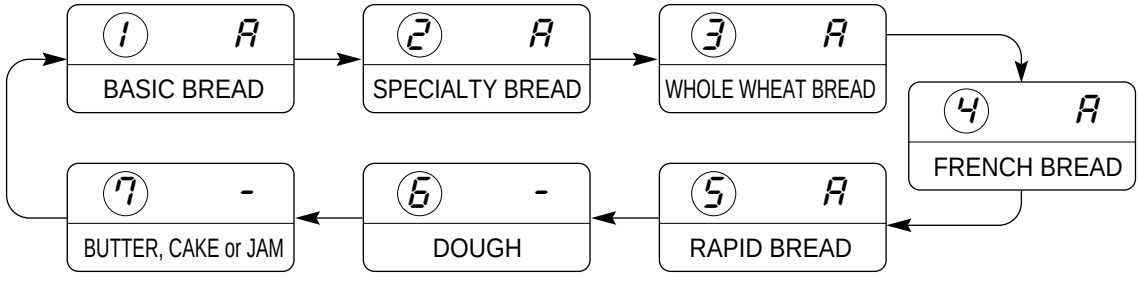
After installation or repair, the following sequence and results should be checked.

1. GENERAL OPERATION CHECK

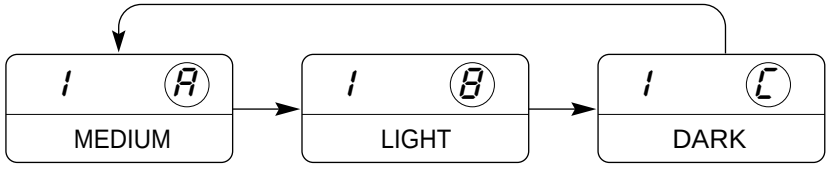
(a) Plug the power cord into a prolonged electrical outlet.

(b) The REMAINING TIME display 1A and Basic Bread is set already.

(c) **Check the PROGRAM SELECT.**
Press the PROGRAM SELECT pad, then REMAINING TIME will advance as follows:

MODEL	REMAINING TIME displays
Refer to the cover page	

(d) **Check the BAKING CONTROL** (except for BUTTER, CAKE or JAM and DOUGH program).
Press the BAKING CONTROL pad, then the REMAINING TIME will advance as follows:



(e) **Check the TIMER**

Set the timer for how long you want to wait before the bread is done (from 4:10 to 13:00 in 10 minutes interval).

1) Press TIMER UP PAD(▲) once, the REMAINING TIME DISPLAY 4:10.

2) When constant pressure is applied to the pad, the time will advance quickly from 4:10 to 13:00.

3) After 13:00 is set, press once more, then the REMAINING TIME displays 4:10.

4) If you pass the time that you wanted, press TIMER DOWN PAD (▼) to go back.

(f) After selecting PROGRAM SELECT and BAKING CONTROL, press the START pad. Then the colon on the REMAINING TIME blinks to indicate that the breadmaker starts to operate.

(g) Press the CANCEL(STOP) pad to cancel all baking processes. If the START pad is already pressed, just press the CANCEL(STOP) pad and hold for MORE THAN 1 SECOND.

CAUTION

1. The TIMER can not be used in BUTTER, CAKE AND JAM.
2. After setting the time, press the START pad to operate the breadmaker. Check to see if the colon blinks.

2. TEST KEY PROGRAM CHECK

You can check the operating of each load by using the self-diagnosis program.

(a) **OPERATION CHECK**

1) When power is supplied while pressing the TIMER UP PAD (▲) and TIMER DOWN PAD (▼) at the same time, the self-diagnosis program will start.

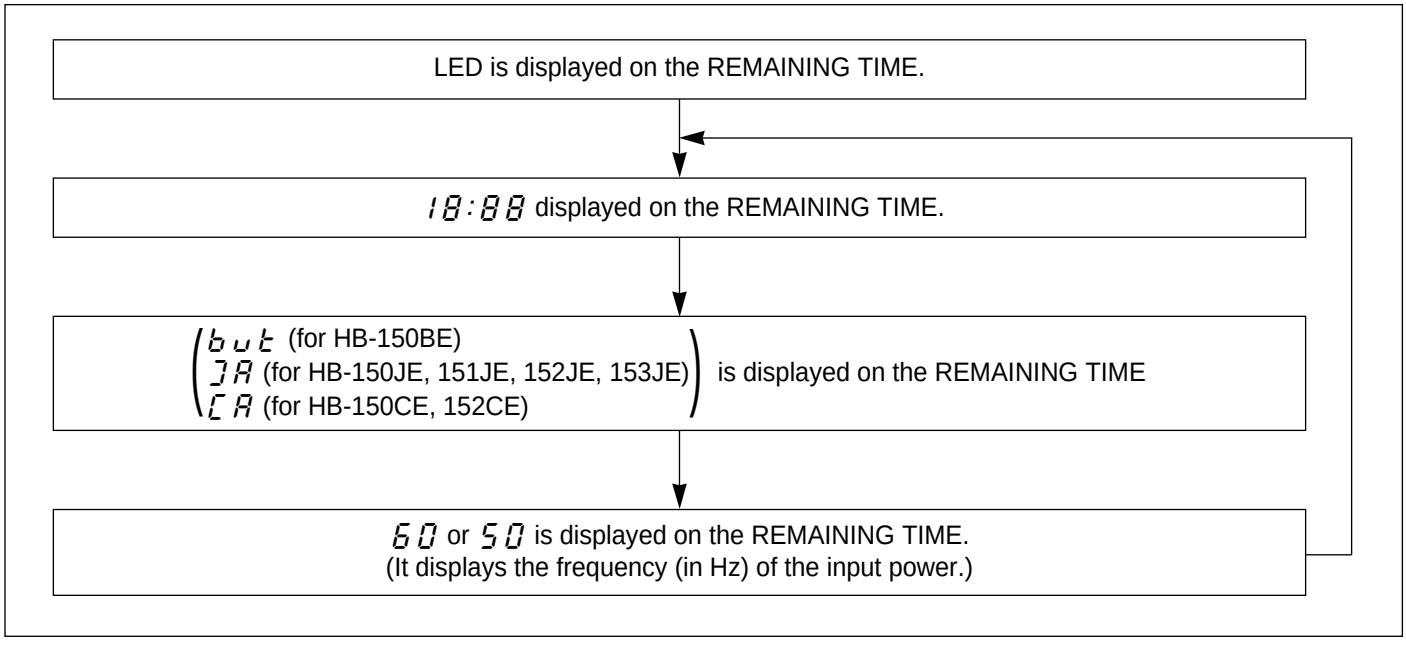
2) After checking 1), press the START pad, then the process will advance as follows.

REMAINING TIME display	P:1	P:2	P:3	P:0 → P:1 →
OPERATION	Kneading motor	Heater	No operation	.....

3) After 25 seconds from the starting points of processing, or if the CANCEL(STOP) pad is pressed, the self-diagnosis program will be canceled.

(b) **LED CHECK**

1) When power is supplied while pressing the BASIC and WHOLE WHEAT pads at the same time, the self-diagnosis program will start as follows.


LED is displayed on the REMAINING TIME.
18:88 displayed on the REMAINING TIME.
but (for HB-150BE)
JA (for HB-150JE, 151JE, 152JE, 153JE)
CA (for HB-150CE, 152CE)
is displayed on the REMAINING TIME
60 or 50 is displayed on the REMAINING TIME.
(It displays the frequency (in Hz) of the input power.)

(c) **BAKING PROCESS CHECK** (for the only BASIC BREAD)

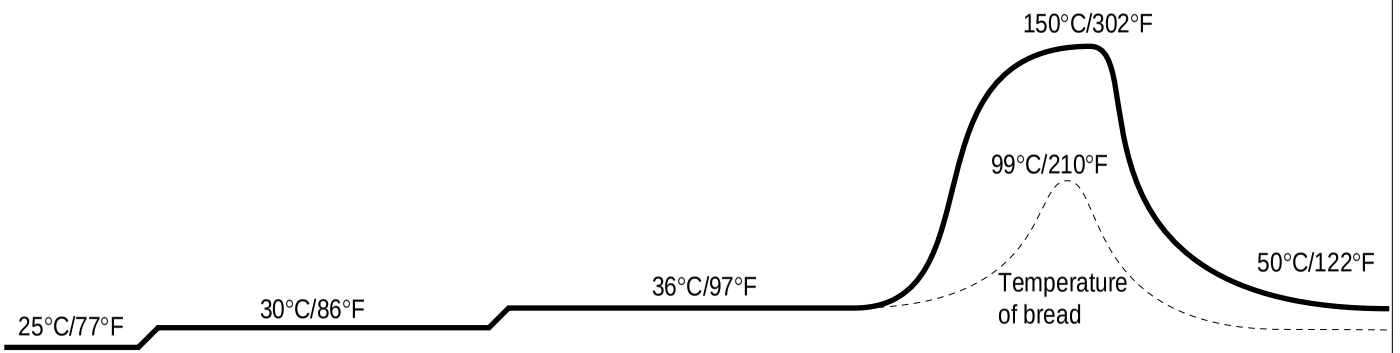
1) When power is supplied while pressing the START pad and CANCEL(STOP) pad at the same time, the self-diagnosis program will start.
2) After checking the REMAINING TIME (1:A displayed with beeps), press the START pad.
3) The breadmaker starts to operate and the baking process will advance as follows.

Baking Process	Time set	Mix	1st Knead	Rest	2nd Knead	1st Rise	Gas Squeeze	2nd Rise	Gas Squeeze	3rd Rise	Bake	Cool	Warm	End
REMAIN-ING Time	0:00	3:40	3:38	3:33	3:28	3:16	2:37	2:36	2:11	2:10	1:10	0:20	[:H]	END
Baking Process indicator (OPTION)	-	KNEAD				RISE					BAKE	COOL	-	-

4) During checking 3), if the START pad was not pressed, the process will advance to the next process according as time pass.
5) After checking 4), press the CANCEL(STOP) pad to cancel the self-diagnosis program.

3. BREADMAKING PROGRAM

3-1) EXPLANATION OF BASIC PROGRAM (BASIC BREAD)

Process	Time Delay	1st Knead		Rest	2nd Knead	1st Rise	Gas Squeeze	2nd Rise	Gas Squeeze	3nd Rise	Bake	Cool	Warm	End
Time	Max 8:50	2min.	5min.	5min.	12min.	40min.	4sec.	26min.	4sec.	60min.	Approx. 50min.	Approx. 20min.	3hours	–
Remaining Time	Max 13:00	3:40	3:38	3:33	3:28	3:16	2:37	2:36	2:11	2:10	1:10	0:20	[:H]	End
Process Indicator (OPTION)	Time Set	Knead				Rise					Bake	Cool	–	–
Heater	On/Off											Off	On/Off	–
Kneading Motor	Off	On/Off	On	Off	On	Off	On	Off	On	Off				–
Temperature of oven case														

Micro-Computer Contorl	Time Delay	Knead	Rise	Bake	Cool	Warm	End
	The temperature is controled at 25°C (77°F).	Breadmaker starts to operate intermittently to proof flour splashed for 2 minutes. After mixing flour with water, kneading blade rotates with 250rpm for 5 minutes. After resting for 5 minutes, rotation again for 12 minutes. During knead and rest courses, the temperature is maintained at 30°C (86°F) by using the sensor and heater.	Accurate temperature control is essential during rising, (Dough temperature: Approx. 36°C (97°F). Microcomputer controls the power supply accurately to keep suitable dough temperature.	Bread is baked with high power. Bread is baked with a crisp golden crust and a fluffy inside.	Immediately after baking, bread can not be eaten because it's too hot.	Breadmaker maintains the bread at a suitable temperature (60°C/140°F) for 3 hours.	–

3-2) PROGRAM SPECIFICATIONS

(1) Basic Bread (3:40)

Remark	Timer	Knead				Rise					Bake	Cool	Warm
		Mix	1' Knead	Rest	2' Knead	1' Rise	G/Squeeze	2' Rise	G/Squeeze	3' Rise			
Time	13hr	2min.	5min.	5min.	12min.	40min.	4sec.	26min.	4sec.	60min.	50min.	20min.	3hr

(2) Specialty Bread (3:40) ▼ Beep sounds 9 minutes before the end of 2nd kneading

Remark	Timer	Knead				Rise					Bake	Cool	Warm
		Mix	1' Knead	Rest	2' Knead	1' Rise	G/Squeeze	2' Rise	G/Squeeze	3' Rise			
Time	13hr	2min.	5min.	5min.	12min.	40min.	4sec.	26min.	4sec.	60min.	50min.	20min.	3hr

(3) Whole Wheat Bread (4:00) ▼ Beep sounds 9 minutes before the end of 2nd kneading

Remark	Timer	Pre Heat	Knead				Rise					Bake	Cool	Warm
			Mix	1' Knead	Rest	2' Knead	1' Rise	G/Squeeze	2' Rise	G/Squeeze	3' Rise			
Time	13hr	20min.	2min.	11min.	50min.	12min.	20min.	4sec.	15min.	4sec.	40min.	50min.	20min.	3hr

(4) French Bread (4:00) ▼ Beep sounds 9 minutes before the end of 2nd kneading

Remark	Timer	Pre Heat	Knead				Rise					Bake	Cool	Warm
			Mix	1' Knead	Rest	2' Knead	1' Rise	G/Squeeze	2' Rise	G/Squeeze	3' Rise			
Time	13hr	20min.	2min.	11min.	50min.	12min.	20min.	4sec.	15min.	4sec.	40min.	50min.	20min.	3hr

(5) Rapid Bread (1:59) ▼ Beep sounds 5 minutes before the end of 2nd kneading

Remark	Timer	Knead				Rise					Bake	Cool	Warm
		Mix	1' Knead	Rest	2' Knead	1' Rise	G/Squeeze	2' Rise	G/Squeeze	3' Rise			
Time	13hr	2min.	5min.	5min.	7min.	13min.	4sec.			52min.	35min.		3hr

(6) Dough (1:03)

Remark	Remaining	Knead				Rise	
		Mix	1' Knead	Rest	2' Knead	1' Rise	G/Squeeze
Time	13hr	2min.	4min.	5min.	12min.	40min.	4sec.

(7) Butter

Remark	Timer	Knead
Time		01min.~30min.

(8) Cake (1:10)

Remark	Timer	Bake	Cool	Warm
Time		60min.	10min.	3hr

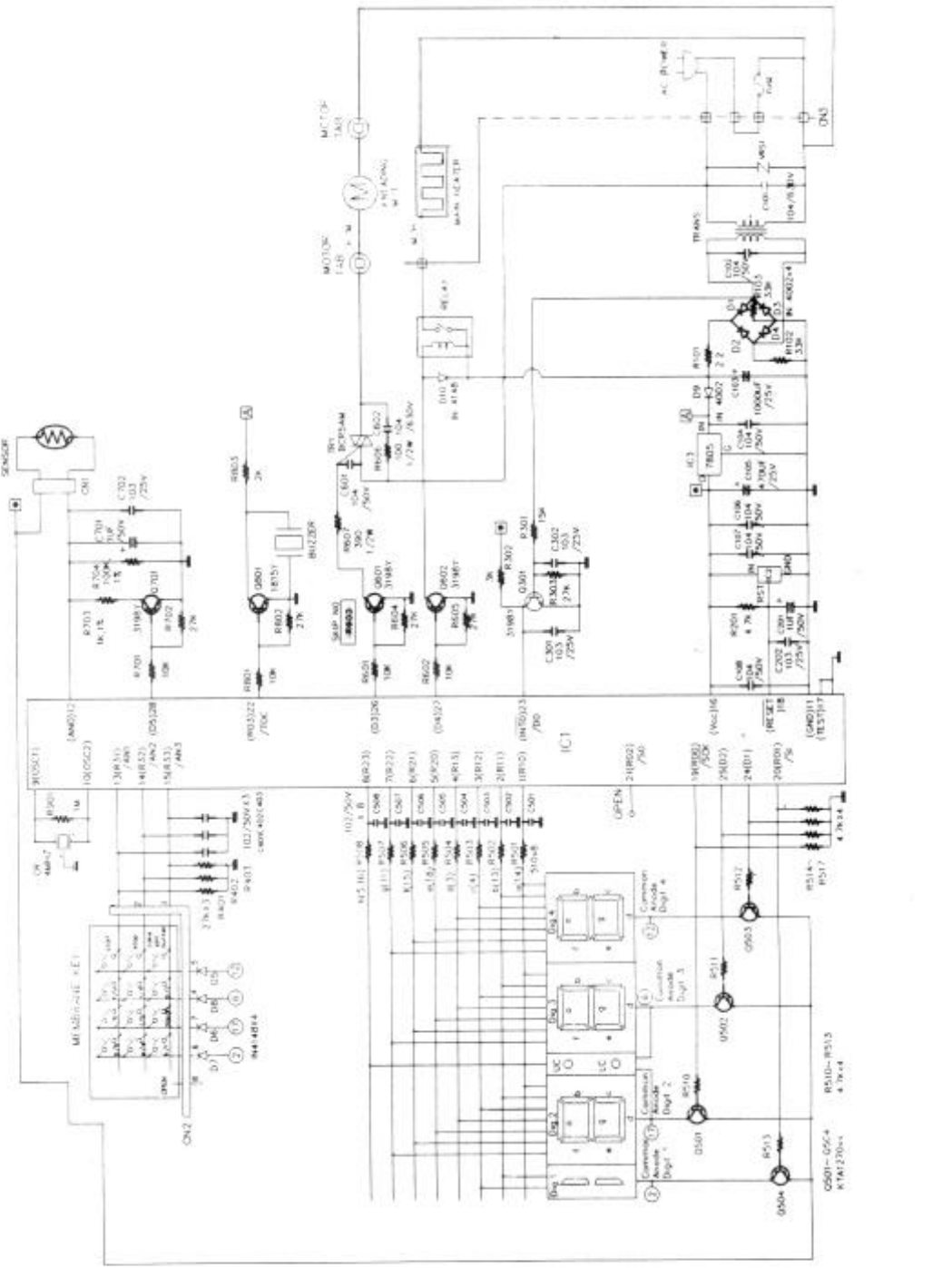
(9) Jam (1:20)

Remark	Timer	Pre Bake	Bake	Cool
Time		10min.	60min.	10min.

NOTE

1. The Specialty Bread, Whole Wheat Bread, and French Bread Programs contain an audible signal (8 beeps) which sounds 9 minutes before the end of the 2nd knead (5 minutes before the end of the 2nd knead for Rapid Program). For specialty bread, add additional ingredients at this time (i.e. raisins, nut, vegetables, etc.).
2. The Basic Bread, Specialty Bread, Whole Wheat Bread, and French Bread Programs contain an audible signals (4 beeps) at the end of the baking cycle (20 minutes of cooling time remain).
3. The beeper beeps 8 times at the end of each program to indicate the program is finished.

SCHEMATIC DIAGRAM



CONTROLLER PARTS LIST

LOCA. No.	DESCRIPTION	PART No.				Q'TY	SVC MARK	REMARKS
		HB-150E	HB-151E	HB-152E	HB-153E			
1	P.W.B	6870FX5001A	6870FX5001A	6870FX5002A	6870FX5001A	1		
2	LSI(MASK)	OIHI404344L				1		BE,60Hz
		OIHI404344M	OIHI404344M		OIHI404344M			JE,60Hz
				OIHI404344N				CE,60Hz
			OIHI404344P		OIHI404344P			JE,50Hz
		OIHI404344Q		OIHI404344Q				CE,50Hz
3	RELAY	6920FX5003A				1		
		CQ65115D						
4	TRIAC	1CQ33025A				1		
5	7-SEGMENT	6327FX3001A				1		
6	IC(REGULATOR)	1OIKE780500H				1		
7	BUZZER	6908FX4003A				1		
8	C.RESONATOR	3W50751A				1		
9	RESET IC	OIKE704200A				1		
10	TRANSISTOR	OTR319809AA				5		
11	TRANSISTOR	OTR127009AA				4		
12	DIODE.R	ODD139209AA				5		
13	DIODE.S	ODD414809AB				5		
14	M.TRANS	6170FX2002A				1		120V/60Hz
		6170FX2002H						230V/50Hz
		6170FX2002J						100V/50,60Hz
15	VARISTOR	CQ39127A				1		
16	RESISTOR, FIXED	ORD0221F608				1		
17	RESISTOR, FIXED	ORD1002F608				4		
18	RESISTOR, FIXED	ORD2702F608				8		
19	RESISTOR, FIXED	ORD1004F608				1		
20	RESISTOR, FIXED	ORD4701F608				9		
21	RESISTOR, FIXED	ORD0221G608				1		
22	RESISTOR, FIXED	ORD3302F608				2		
23	RESISTOR, FIXED	ORD5100F608				8		
24	RESISTOR, FIXED	ORD3001F608				1		
25	RESISTOR, FIXED	ORD1502F608				1		
26	RESISTOR, MET	ORS1000H609				1		
27	RESISTOR, MET	ORS3900H609				1		
28	RESISTOR, MET	ORN1053F408				1		
29	RESISTOR, MET	ORN8000F408				1		
30	CERAMIC, CAPA	OCK1040K948				5		
31	CERAMIC, CAPA	OCK1030K948				4		
32	CERAMIC, CAPA	OCK1020K518				11		
33	ELECT, CAPA	OCE1081H618				1		

LOCA. No.	DESCRIPTION	PART No.				Q'TY	SVC MARK	REMARKS
		HB-150E	HB-151E	HB-152E	HB-153E			
34	ELECT, CAPA	OCE4771H618				1		
35	ELECT, CAPA	OCE1051K638				2		
36	C, METAL	OCQ1041K509				1		
37	C, METAL	OCQ1041Y539				2		120V
38	P.P FILM CAPACITOR	3O80046A						220/230/240V
39	CONNECTOR	6630FX4002A				1		
40	CONNECTOR	6630FX4001A				1		
41	WAFER	4H90045A				1		
42	TAB	4I72022A				2		